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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,968	09/11/2003	David M. Haaland	6969.2/103411	8987
20567	7590	06/30/2004	EXAMINER	
SANDIA CORPORATION P O BOX 5800 MS-0161 ALBUQUERQUE, NM 87185-0161			LE, JOHN H	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/661,968

Applicant(s)

HAALAND ET AL.

Examiner

John H Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 25-86 is/are pending in the application.
- 4a) Of the above claim(s) 25-38 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39-86 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Respons to Restriction***

1. Applicant's response filed 06/07/2004 has been entered and carefully considered.
2. Applicant's election with traverse of Group III (Claims 39-50, 75-86) in Paper mail on 06/07/2004 is acknowledged. The traversal is on the ground(s) that:

-The claims of group III, IV, and V are the same group and claim 39c) starts by guessing pure-component spectra K and 75c) starts by guessing a set of component values C. How the steps of claims 39 and 75 evolve thereafter depends on these initial guesses, analogous to the evolution of claims 51 and 63.

After review, the Examiner agrees with attorney that groups III, IV, and V are in the same group. Therefore group III includes claims 39-86.

- The inventions as claimed are not directed to separate subclasses, as asserted by the Office, but can each be used for all of the subclasses of chemical analysis in class 702, subclass 22. Indeed, all of these methods are applicable to the analysis of a wide variety of multivariate spectral data.

This is not found persuasive because inventions of group I and group II have different functions, inventions of group II and group III have different functions, and invention of group I does not required step b) decomposing the spectral error covariance  $E_A$  according to  $E_A = TP + E$ , where T is a set of  $n \times p$  loading vectors obtained from factor analysis of the spectral error covariance  $E_A$ , and E is a set of  $n \times p$  random errors and spectral variations not useful for prediction of group III and invention of group III does not required step iv)

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obtaining component residuals  $E_c$  according to  $E_c = C - C$  of group I.

The requirement is still deemed proper and is therefore made FINAL.

Claims 25-38 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper mailed 06/07/2004.

3. This application contains claims 25-38 are drawn to an invention nonelected with traverse in the reply filed on 06/07/2004. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Allowable Subject Matter***

4. Claims 39-86 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

In combination with other limitations of the claims, the cited prior arts fail to teach steps of decomposing the spectral error covariance  $E_A$  according to  $E_A = TP + E$ , where  $T$  is a set of  $n \times r$  scores and  $P$  is a set of  $r \times p$  loading vectors obtained from factor analysis of the spectral error covariance  $E_A$ , and  $E$  is a set of  $n \times p$  random errors and spectral variations not useful for prediction; guessing pure-component spectra  $K$  for the set of multivariate spectral data  $A$ ; testing for convergence according to  $\|A - CK\|^2$ , as recited in claims 39, 51, 63, and 75.

U.S. Patent No. 6,415,233 discloses a method for performing an improved classical least squares multivariate estimation of the quantity of at least one

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constituent of a sample comprising first utilizing a previously constructed calibration data set expressed as matrix  $\hat{K}$  representing the combination of vectors expressing the spectral shapes and concentrations of the measured pure sample constituents of the calibration data set, measuring the response of the sample that contains the constituents in the calibration data set as well as additional constituents and additional system effects not present in the calibration data set to form a prediction data set, adding at least one vector expressing the spectral shape (but not concentration) of at least one additional constituent or additional system effect not present in the calibration data set but present in the prediction data set to form an augmented matrix  $\tilde{K}$ , and estimating the quantity of at least one of the constituents in the calibration data set that is present in the sample by utilizing the augmented matrix  $\tilde{K}$ . '233 fails to specify steps of decomposing the spectral error covariance  $E_A$  according to  $E_A = TP + E$ , where  $T$  is a set of  $n \times r$  scores and  $P$  is a set of  $r \times p$  loading vectors obtained from factor analysis of the spectral error covariance  $E_A$ , and  $E$  is a set of  $n \times p$  random errors and spectral variations not useful for prediction; guessing pure-component spectra  $K$  for the set of multivariate spectral data  $A$ ; testing for convergence according to  $\|A - CK\|^2$  as now recited in claims 39, 51, 63, and 75 of the present invention.

U.S. Patent No. 6,341,257 discloses a method for estimating the quantity of at least one known constituent or property in a sample comprising first forming a classical least squares calibration model to estimate the responses of individual pure components of at least one of the constituents or parameters affecting the

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optical response of the sample and employing a cross validation of the samples in the calibration data set, then measuring the response of the mixture to the stimulus at a plurality of wavelengths to form a prediction data set, then estimating the quantity of one of the known constituents or parameters affecting the calibration data set by a classical least squares analysis of the prediction data set wherein such analysis produces residual errors, and then passing the residual errors to a partial least squares, principal components regression, or other inverse algorithm to provide an improved estimate of the quantity of the one known constituent or parameter affecting the sample. '257 fails to specify steps of decomposing the spectral error covariance  $E_A$  according to  $E_A = TP + E$ , where  $T$  is a set of  $n \times r$  scores and  $P$  is a set of  $r \times p$  loading vectors obtained from factor analysis of the spectral error covariance  $E_A$ , and  $E$  is a set of  $n \times p$  random errors and spectral variations not useful for prediction; guessing pure-component spectra  $K$  for the set of multivariate spectral data  $A$ ; testing for convergence according to  $\|A - CK\|^2$  as now recited in claims 39, 51, 63, and 75 of the present invention.

### ***Response to Arguments***

5. Applicant's arguments filed 06/07/2004 have been fully considered but they are not persuasive.

-Applicant argues that "the inventions as claimed are not directed to separate subclasses, as asserted by the Office, but can each be used for all of the subclasses of chemical analysis in class 702, subclass 22. Indeed, all of

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these methods are applicable to the analysis of a wide variety of multivariate spectral data".

This is not found persuasive because inventions of group I and group II have different functions, inventions of group II and group III have different functions, and invention of group I does not required step b) decomposing the spectral error covariance  $E_A$  according to  $E_A = TP + E$ , where T is a set of  $n \times p$  loading vectors obtained from factor analysis of the spectral error covariance  $E_A$ , and E is a set of  $n \times p$  random errors and spectral variations not useful for prediction of group III and invention of group III does not required step iv) obtaining component residuals  $E_c$  according to  $E_c = C - C$  of group I.

The requirement is still deemed proper and is therefore made FINAL.

Claims 25-38 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a non-elected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper mailed 06/07/2004.

This application contains claims 25-38 are drawn to an invention nonelected with traverse in the reply filed on 06/07/2004. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

#### ***Contact Information***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H Le whose telephone number is 571-272-2275. The examiner can normally be reached on 9:00 - 5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

June 25, 2004



John Barlow  
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